



## NUCLEAR REGULATORY COMMISSION

[Docket No. 50-184; NRC-2022-0194]

National Institute of Standards and Technology

National Bureau of Standards Test Reactor

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** License amendment application; opportunity to comment, request a hearing, and petition for leave to intervene.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC, the Commission) is considering issuance of an amendment to Renewed Facility Operating License No. TR-5, issued to the U.S. Department of Commerce, National Institute of Standards and Technology (NIST), for operation of the National Bureau of Standards test reactor (NBSR). The proposed amendment would revise the NBSR Safety Analysis Report (SAR) to allow reactor operation with the debris that remains in the reactor primary coolant system from the February 3, 2021, fuel damage event and after the subsequent cleaning operations. The proposed amendment would not authorize the restart of the NBSR.

**DATES:** Submit comments by **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Requests for a hearing or petitions for leave to intervene must be filed by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

**ADDRESSES:** You may submit comments by any of the following methods; however, the NRC encourages electronic comment submission through the **Federal rulemaking website**:

- **Federal rulemaking website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2022-0194**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: [Stacy.Schumann@nrc.gov](mailto:Stacy.Schumann@nrc.gov). For

technical questions, contact the individual listed in the “For Further Information Contact” section of this document.

- **Mail comments to:** Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing Staff.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the SUPPLEMENTARY INFORMATION section of this document.

**FOR FURTHER INFORMATION CONTACT:** Patrick Boyle, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; telephone: 301-415-3936; email: Patrick.Boyle@nrc.gov

**SUPPLEMENTARY INFORMATION:**

**I. Obtaining Information and Submitting Comments**

**A. Obtaining Information**

Please refer to Docket ID **NRC-2022-0194** when contacting the NRC about the availability of information for this action. You may obtain publicly available information related to this action by any of the following methods:

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2022-0194**.

- **NRC’s Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select “Begin Web-based ADAMS Search.” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov). The license amendment request dated October 19, 2022, is available in ADAMS under Accession No. ML22293B808.

- **NRC’s PDR:** You may examine and purchase copies of public documents, by appointment, at the NRC’s PDR, Room P1 B35, One White Flint North, 11555

Rockville Pike, Rockville, Maryland 20852. To make an appointment to visit the PDR, please send an email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov) or call 1-800-397-4209 or 301-415-4737, between 8:00 a.m. and 4:00 p.m. Eastern Time (ET), Monday through Friday, except Federal holidays.

#### B. Submitting Comments

The NRC encourages electronic comment submission through the **Federal rulemaking website** (<https://www.regulations.gov>). Please include Docket ID **NRC-2022-0194** in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <https://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

## II. Introduction

The NRC is considering issuance of an amendment to Renewed Facility Operating License No. TR-5, issued to NIST, for operation of the NBSR, located in Montgomery County, MD.

The proposed license amendment would revise the NBSR SAR to allow reactor operation with the debris that remains in the reactor primary coolant system from the February 3, 2021, fuel damage event and after the subsequent cleaning operations. NIST stated that its calculations determined that the maximum possible quantity of debris in the system was initially 66 grams and that not all of this debris had been

removed via the cleaning operations of retrieval and filtering. To operate with the remaining debris in the system, NIST proposed changes to Chapter 5, "Reactor Coolant Systems," and Chapter 11, "Radiation Protection and Waste Management," of the SAR. Specifically, Section 5.2.2.4.4 would be added to the SAR to address the impact of the remaining debris on the primary system pumps, valves, piping, heat exchangers, and instrumentation and Section 11.1.1.4.3.1 would be added to the SAR to address the potential impact of small amounts of debris remaining in the reactor on the fission product monitor and other effluent monitors. The proposed license amendment would not authorize the restart of the NBSR.

Before any issuance of the proposed license amendment, the NRC will need to make the findings required by the Atomic Energy Act of 1954, as amended (the Act), and NRC's regulations.

The NRC has made a proposed determination that the license amendment request involves no significant hazards consideration. Under the NRC's regulations in § 50.92 of title 10 of the *Code of Federal Regulations* (10 CFR), this means that operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of no significant hazards consideration, which is presented below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

None of the accidents analyzed in the FSAR would be more than minimally affected by the presence of fuel particles in the primary system, as a) the mass and size of fuel material is too insignificant to cause any reactivity effects in the reactor, cause flow blockage effects in the system, or limit mechanical devices (i.e. shim arms) if it were to be dislodged and b) the presence of this material has no effect on normal operating parameters. Only two accidents analyzed in Chapter 13 of the [SAR] show results of release of radioactivity: the loss of coolant accident (LOCA) and the maximum hypothetical accident (MHA). The

presence of fission products in the primary system has no effect on the consequences of any of the other accidents analyzed.

The MHA considers melting of an entire 8-cycle fuel element. The addition of-at most-a few grams of fuel would be insignificant in comparison. Both the MHA and LOCA accidents result in a total dose of less than 6.5 mrem at the site boundary. By contrast, it is estimated that the presence of the largest piece of remaining fuel material being lodged in the core (which is too large to be carried into the core by normal primary flow velocities) would result in a site boundary dose being at most 0.13 mrem/day, which also conservatively assumes the reactor continues to operate. Thus, there is no more than a minimal increase in the consequences of accidents previously analyzed.

Also, once a LOCA occurs it makes no significant difference if the fission products are laid out on the floor of the process room (submerged in the heavily tritiated primary water) or held in the plumbing. The dose effects of the fission products are insignificant compared to the dose effects of the heavy water that is exposed via the LOCA.

Calculations have shown that that debris larger than 0.093 [inches] will not be transported into the core with the liquid velocity range present in the NBSR inlet and outlet plena leading to the core. Smaller particles have been largely removed by filtration. Thus, remaining debris in the primary system is unlikely to be dislodged into the core.

Therefore, the proposed [SAR] amendment allowing operation with debris in the primary system will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

Because of the limited amount and size of material present in the primary system and the limited primary flow velocity, there is no credible scenario whereby the release of material present in the primary system would cause significant flow blockage, mechanical interference, heating, or reactivity effects. Any introduction of the small amount of material into the core would fall into the realm of (and be easily bounded by) the maximum hypothetical accident, which assumes melting of an entire fuel element. No other changes to reactor parameters or operations are being proposed. The proposed amendment to the SAR will not change the operations, process variables or reactor structures, systems, or components.

Therefore, the proposed amendment for operation with small amounts of debris from the February 3, 2021, event will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed license amendment is to modify the NBSR SAR to allow operations with a small amount of debris from the February 3, 2021, incident in the primary system. Calculations have shown that that debris larger than 0.093

[inches] will not be transported into the core with the liquid velocity range present in the NBSR inlet and outlet plena leading to the core. Smaller particles have been largely removed by filtration. Thus, because of the limited amount and size of material present in the primary system and the limited primary flow velocity, there is no credible scenario whereby the release of material present in the primary system would cause significant flow blockage, mechanical interference, heating, or reactivity effects, and is insufficient to cause a significant reduction in any margin of safety. Therefore, the proposed amendment of the SAR in allowing this operation does not involve a significant reduction in a margin of safety.

The NRC staff has reviewed the licensee's analysis and based on this review, it appears that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff proposes to determine that the license amendment request involves a no significant hazards consideration.

The NRC is seeking public comments on this proposed determination that the license amendment request involves no significant hazards consideration. Any comments received within 30 days after the date of publication of this notice will be considered in making any final determination.

Normally, the Commission will not issue the amendment until the expiration of 60 days after the date of publication of this notice. The Commission may issue the license amendment before expiration of the 60-day notice period if the Commission concludes the amendment involves no significant hazards consideration. In addition, the Commission may issue the amendment prior to the expiration of the 30-day comment period if circumstances change during the 30-day comment period such that failure to act in a timely way would result, for example, in prevention of resumption of reactor operation. If the Commission takes action prior to the expiration of either the comment period or the notice period, it will publish in the *Federal Register* a notice of issuance. If the Commission makes a final no significant hazards consideration determination, any hearing will take place after issuance. The Commission expects that the need to take this action will occur very infrequently.

### **III. Opportunity to Request a Hearing and Petition for Leave to Intervene**

Within 60 days after the date of publication of this notice, any person (petitioner) whose interest may be affected by this action may file a request for a hearing and

petition for leave to intervene (petition) with respect to the action. Petitions shall be filed in accordance with the Commission's "Agency Rules of Practice and Procedure" in 10 CFR part 2. Interested persons should consult 10 CFR 2.309. If a petition is filed, the presiding officer will rule on the petition and, if appropriate, a notice of a hearing will be issued.

Petitions must be filed no later than 60 days from the date of publication of this notice in accordance with the filing instructions in the "Electronic Submissions (E-Filing)" section of this document. Petitions and motions for leave to file new or amended contentions that are filed after the deadline will not be entertained absent a determination by the presiding officer that the filing demonstrates good cause by satisfying the three factors in 10 CFR 2.309(c)(1)(i) through (iii).

If a hearing is requested and the Commission has not made a final determination on the issue of no significant hazards consideration, the Commission will make a final determination on the issue of no significant hazards consideration, which will serve to establish when the hearing is held. If the final determination is that the amendment request involves no significant hazards consideration, the Commission may issue the amendment and make it immediately effective, notwithstanding the request for a hearing. Any hearing would take place after issuance of the amendment. If the final determination is that the amendment request involves a significant hazards consideration, then any hearing held would take place before the issuance of the amendment unless the Commission finds an imminent danger to the health or safety of the public, in which case it will issue an appropriate order or rule under 10 CFR part 2.

A State, local governmental body, Federally recognized Indian Tribe, or designated agency thereof, may submit a petition to the Commission to participate as a party under 10 CFR 2.309(h) no later than 60 days from the date of publication of this notice. Alternatively, a State, local governmental body, Federally recognized Indian Tribe, or agency thereof may participate as a non-party under 10 CFR 2.315(c).

For information about filing a petition and about participation by a person not a party under 10 CFR 2.315, see ADAMS Accession No. ML20340A053 (<https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML20340A053>) and on the NRC's public website at <https://www.nrc.gov/about-nrc/regulatory/adjudicatory/hearing.html#participate>.

#### **IV. Electronic Submissions (E-Filing)**

All documents filed in NRC adjudicatory proceedings including documents filed by an interested State, local governmental body, Federally recognized Indian Tribe, or designated agency thereof that requests to participate under 10 CFR 2.315(c), must be filed in accordance with 10 CFR 2.302. The E-Filing process requires participants to submit and serve all adjudicatory documents over the internet, or in some cases, to mail copies on electronic storage media, unless an exemption permitting an alternative filing method, as further discussed, is granted. Detailed guidance on electronic submissions is located in the "Guidance for Electronic Submissions to the NRC" (ADAMS Accession No. ML13031A056) and on the NRC's public website at <https://www.nrc.gov/site-help/e-submittals.html>.

To comply with the procedural requirements of E-Filing, at least 10 days prior to the filing deadline, the participant should contact the Office of the Secretary by email at [Hearing.Docket@nrc.gov](mailto:Hearing.Docket@nrc.gov), or by telephone at 301-415-1677, to (1) request a digital identification (ID) certificate, which allows the participant (or its counsel or representative) to digitally sign submissions and access the E-Filing system for any proceeding in which it is participating; and (2) advise the Secretary that the participant will be submitting a petition or other adjudicatory document (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the proceeding if the Secretary has not already established an electronic docket.



Information about applying for a digital ID certificate is available on the NRC's public website at <https://www.nrc.gov/site-help/e-submittals/getting-started.html>. After a digital ID certificate is obtained and a docket created, the participant must submit adjudicatory documents in Portable Document Format. Guidance on submissions is available on the NRC's public website at <https://www.nrc.gov/site-help/electronic-sub-ref-mat.html>. A filing is considered complete at the time the document is submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. ET on the due date. Upon receipt of a transmission, the E-Filing system time-stamps the document and sends the submitter an email confirming receipt of the document. The E-Filing system also distributes an email that provides access to the document to the NRC's Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the document on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before adjudicatory documents are filed to obtain access to the documents via the E-Filing system.

A person filing electronically using the NRC's adjudicatory E-Filing system may seek assistance by contacting the NRC's Electronic Filing Help Desk through the "Contact Us" link located on the NRC's public website at <https://www.nrc.gov/site-help/e-submittals.html>, by email to [MSHD.Resource@nrc.gov](mailto:MSHD.Resource@nrc.gov), or by a toll-free call at 1-866-672-7640. The NRC Electronic Filing Help Desk is available between 9:00 a.m. and 6:00 p.m., ET, Monday through Friday, except Federal holidays.

Participants who believe that they have good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their initial paper filing stating why there is good cause for not filing electronically and requesting authorization to continue to submit documents in paper format. Such filings must be submitted in accordance with 10 CFR 2.302(b)-(d). Participants filing adjudicatory documents in this manner are responsible for serving their documents on all

other participants. Participants granted an exemption under 10 CFR 2.302(g)(2) must still meet the electronic formatting requirement in 10 CFR 2.302(g)(1), unless the participant also seeks and is granted an exemption from 10 CFR 2.302(g)(1).

Documents submitted in adjudicatory proceedings will appear in the NRC's electronic hearing docket, which is publicly available at <https://adams.nrc.gov/ehd>, unless excluded pursuant to an order of the presiding officer. If you do not have an NRC-issued digital ID certificate as previously described, click "cancel" when the link requests certificates and you will be automatically directed to the NRC's electronic hearing dockets where you will be able to access any publicly available documents in a particular hearing docket. Participants are requested not to include personal privacy information such as social security numbers, home addresses, or personal phone numbers in their filings unless an NRC regulation or other law requires submission of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants should not include copyrighted materials in their submission.

For further details with respect to this action, see the application for license amendment dated October 19, 2022.

*Attorney for licensee:* Henry N. Wixon, Chief of Counsel, National Institute of Standards and Technology, 100 Bureau Drive, Stop 1052, Gaithersburg, MD 20899-1052.

*NRC Branch Chief:* Joshua Borromeo

Dated: November 10, 2022.

For the Nuclear Regulatory Commission.

Patrick Boyle, Project Manager,  
Non-Power Production and Utilization  
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